

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

1. A method of reducing a microbial population on poultry during processing comprising:  
applying to the poultry during processing a medium chain peroxycarboxylic acid antimicrobial composition in an amount and time sufficient to reduce the microbial population;  
the medium chain peroxycarboxylic acid antimicrobial composition comprising:  
about 2 to about 500 ppm peroxyoctanoic acid;  
about 5 to about 2000 ppm octanoic acid;  
about 95 to about 99.99 wt-% water; and  
about 2 to about 16,000 ppm polyalkylene oxide, monoalkyl ether of polyalkylene oxide, dialkyl ether of polyalkylene oxide, nonionic surfactant, anionic surfactant, or mixture thereof;  
the composition comprising at least about 2 parts by weight of peroxyoctanoic acid for each 7 parts by weight of octanoic acid.
2. A method of recycling water previously applied to poultry, the method comprising:  
recovering a medium chain peroxycarboxylic acid antimicrobial composition previously applied to poultry; and  
adding to the recovered composition a sufficient amount of a medium chain peroxycarboxylic acid composition to yield a recycled medium chain peroxycarboxylic acid antimicrobial composition;  
the added medium chain peroxycarboxylic acid composition comprising:  
about 0.0005 to about 5 wt-% peroxyoctanoic acid;  
about 0.001 to about 10 wt-% octanoic acid;  
about 5 to about 99.99 wt-% water;

about 0.001 to about 60 wt-% polyalkylene oxide, monoalkyl ether of polyalkylene oxide, dialkyl ether of polyalkylene oxide, nonionic surfactant, anionic surfactant, or mixture thereof;

about 0.002 to about 10 wt-% oxidizing agent;

about 0.001 to about 30 wt-% inorganic acid; and

about 0.001 to about 5 wt-% sequestrant;

the composition comprising at least about 2 parts by weight of peroxyoctanoic acid for each 7 parts by weight of octanoic acid.

3. A method of recycling water previously applied to poultry, the method comprising:

recovering a medium chain peroxycarboxylic acid antimicrobial composition previously applied to poultry; and

adding to the recovered composition a sufficient amount of a medium chain peroxycarboxylic acid composition to yield a recycled medium chain peroxycarboxylic acid antimicrobial composition;

the added medium chain peroxycarboxylic acid composition comprising:

about 0.5 to about 5 wt-% peroxyoctanoic acid;

about 1 to about 10 wt-% octanoic acid;

about 5 to about 97 wt-% water;

about 1 to about 20 wt-% anionic surfactant;

about 5 to about 10 wt-% oxidizing agent;

about 15 to about 35 wt-% inorganic acid; and

about 1 to about 5 wt-% sequestrant;

the composition comprising a microemulsion.

4. A method of recycling water previously applied to poultry, the method comprising:

recovering a medium chain peroxycarboxylic acid antimicrobial composition previously applied to poultry; and

adding to the recovered composition a sufficient amount of a medium chain peroxycarboxylic acid composition to yield a recycled medium chain peroxycarboxylic acid antimicrobial composition;

the added medium chain peroxycarboxylic acid composition comprising:

about 0.0005 to about 5 wt-% peroxyoctanoic acid;

about 0.001 to about 10 wt-% octanoic acid;

about 40 to about 99.99 wt-% water;

about 0.001 to about 60 wt-% polyalkylene oxide, monoalkyl ether of polyalkylene oxide, dialkyl ether of polyalkylene oxide, anionic surfactant, nonionic surfactant, or mixture thereof, or mixture thereof;

about 0.002 to about 10 wt-% oxidizing agent;

about 0.001 to about 30 wt-% inorganic acid; and

about 0.001 to about 5 wt-% sequestrant.

5. An antimicrobial concentrate composition comprising:

a medium chain peroxycarboxylic acid composition effective for reducing the microbial burden on a surface of poultry;

the composition comprising:

about 0.0005 to about 5 wt-% peroxyoctanoic acid;

about 0.001 to about 10 wt-% octanoic acid;

about 5 to about 99.99 wt-% water;

about 0.001 to about 60 wt-% polyalkylene oxide, monoalkyl ether of polyalkylene oxide, dialkyl ether of polyalkylene oxide, nonionic surfactant, anionic surfactant, or mixture thereof;

about 0.002 to about 10 wt-% oxidizing agent;

about 0.001 to about 30 wt-% inorganic acid; and

about 0.001 to about 5 wt-% sequestrant;

the composition comprising at least about 2 parts by weight of peroxyoctanoic acid for each 7 parts by weight of octanoic acid.

6. An antimicrobial concentrate composition comprising:

a medium chain peroxycarboxylic acid composition effective for reducing the microbial burden on a surface of poultry;  
the composition comprising:  
about 0.5 to about 5 wt-% peroxyoctanoic acid;  
about 1 to about 10 wt-% octanoic acid;  
about 5 to about 97 wt-% water;  
about 1 to about 20 wt-% anionic surfactant;  
about 5 to about 10 wt-% oxidizing agent;  
about 15 to about 35 wt-% inorganic acid; and  
about 1 to about 5 wt-% sequestrant;  
the composition comprising a microemulsion.

7. An antimicrobial concentrate composition comprising:  
a medium chain peroxycarboxylic acid composition effective for reducing the microbial burden on a surface of poultry;  
the composition comprising:  
about 0.0005 to about 5 wt-% peroxyoctanoic acid;  
about 0.001 to about 10 wt-% octanoic acid;  
about 40 to about 99.99 wt-% water;  
about 0.001 to about 60 wt-% polyalkylene oxide, monoalkyl ether of polyalkylene oxide, dialkyl ether of polyalkylene oxide, anionic surfactant, nonionic surfactant, or mixture thereof, or mixture thereof;  
about 0.002 to about 10 wt-% oxidizing agent;  
about 0.001 to about 30 wt-% inorganic acid; and  
about 0.001 to about 5 wt-% sequestrant.

8-48. (cancelled)